# A BIBLIOGRAPHY OF BIOLOGICAL LITERATURE ON EPIPHYTES: AN UPDATE

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ABSTRACT. A bibliographic list of 571 citations dealing with the biology of vascular and non-vascular epiphytes that updates the list compiled by Watson *et al.* (1987) is provided. Papers pertinent to the ecology, biochemistry, physiology, anatomy, horticulture, morphology, and natural history of epiphytes from tropical, temperate, and boreal regions are included. Purely taxonomic and floristic accounts are generally excluded. The bibliography is also available in electronic form.

Una bibliografía reciente de temas biologicos sobre epífitas.

RESUMEN. Con el proposito de actualizar la contribución de Watson *et al.* (1987), se presenta una lista de 571 citas bibliográficas relacionadas con la biología de plantas epífitas vasculares y no vasculares. Se incluyen artículos relacionados con la ecología, bioquímica, fisiología, anatomía, horticultura, morfología, e historia natural de epífitas de regiones boreales, templadas y tropicales. Contribuciones puramente taxonómicas y florísticas fueron usualmente excluidas. Esta bibliografía es también disponible en forma electronica.

### Introduction

This bibliography of scientific and horticultural literature about vascular and non-vascular epiphytes is intended as an addendum to a similar bibliography published in Selbyana five years ago (Watson et al., 1987). This earlier publication has proven to be a valuable reference for biologists and one that should be maintained with the addition of pertinent citations. Interest generated at the Second International Symposium on the Biology and Conservation of Epiphytes held 5-9 May 1991 at The Marie Selby Botanical Gardens, further demonstrated the need for an updated bibliography of the current literature. The Symposium was a gathering of scientists, horticulturists, and conservationists with widely diverse interests. A goal of this bibliographic proiect is to reflect that diversity.

In contrast to the original list, this bibliography includes citations related to non-vascular as well as vascular epiphytes. This inclusion reflects the growing interest in these plants, especially in the fields of ecosystem ecology and air-quality monitoring. We also expanded the geographic scope from the tropical emphasis of the original list to include temperate and boreal regions. General subjects included are: evolution, biochemistry, phytosociology, and other areas of biological study (APPENDIX 1). Purely taxonomic and systematic works such as monographs of particular taxa are excluded in this list, as those references are accessible through other sources such as the Kew Index.

The scope of this list was also broadened to include research on the conservation and prop-

agation of epiphytes. Because habitats of epiphytes are facing increasing threats from human activities, these subjects necessarily come to the forefront of epiphyte study. One of the conclusions of the Symposium was that conservation activities must be rooted in sound scientific knowledge of the natural history of the plants and habitats to be conserved; this bibliography may serve as one step in that process.

The citations presented here were collected by a thorough search of relevant publications available to the authors. These included journals, proceedings, books, and unpublished dissertations. Some appropriate citations may have been overlooked, and we request that omissions and corrections be sent to the Director of Research at Selby Gardens for inclusion in the next update.

Most of the citations were verified for correctness either directly from the original publication or reprint or from Biological Abstracts. We could not verify some citations, and those are identified with an asterisk. The citations are listed alphabetically and chronologically by author, followed by year, title, and reference. Each citation was keyworded by the second author to summarize the general subject matter (APPENDIX 1), the type of plant studied (APPENDIX 2), and the geographical region in which the study took place (APPENDIX 3).

This list and the previous list are available on diskette with keywords to facilitate searching and sorting. The lists are available in three forms: a) hardcopy (reprint); b) as unformatted ASCII form; and c) a bibliographic database (PROCITE: Personal Bibliographic Software, Inc., Ann Arbor, Michigan, U.S.A.). Interested persons should

contact the Research Librarian, Selby Gardens, to receive this bibliography.

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APPENDIX 1. Bibliographic citations sorted by subject.

| APPENDIX 1   | Bibliogra | aphic citati | ons sorted   | by subject. | •   |     |            |            |     |
|--------------|-----------|--------------|--------------|-------------|-----|-----|------------|------------|-----|
| Anatomy      |           |              |              |             |     |     |            |            |     |
| 39           | 79        | 168          | 183          | 264         | 394 | 411 | 472        | 536        |     |
| 69           | 99        | 171          | 224          | 350         | 399 | 412 | 478        | 566        |     |
| 70           | 114       | 181          | 241          | 374         | 408 | 413 | 534        |            |     |
| Applications | 5         |              |              |             |     |     |            |            |     |
| 3            | 83        | 128          | 232          | 260         | 314 | 382 | 473        | 520        | 562 |
| 11           | 89        | 135          | 243          | 267         | 328 | 385 | 493        | 537        | -   |
| 23           | 91        | 137          | 244          | 285         | 337 | 386 | 494        | 541        |     |
| 37           | 109       | 142          | 247          | 290         | 347 | 392 | 498        | 542        |     |
| 46           | 110       | 143          | 249          | 291         | 349 | 430 | 499        | 543        |     |
| 49           | 112       | 185          | 251          | 304         | 357 | 438 | 501        | 544        |     |
| 50           | 116       | 203          | 252          | 305         | 364 | 447 | 507        | 548        |     |
| 59           | 119       | 213          | 253          | 306         | 373 | 463 | 514        | 560        |     |
| 78           | 121       | 215          | 254          | 313         | 377 | 464 | 516        | 561        |     |
| Bibliography |           |              |              |             |     |     |            |            |     |
| 251          | 252       | 253          | 254          | 280         | 545 |     |            |            |     |
| Biochemistr  |           |              |              |             |     |     |            |            |     |
| 25           | 149       | 237          | 261          | 353         | 479 | 551 |            |            |     |
| 30           | 184       | 238          | 262          | 365         | 488 | 552 |            |            |     |
| 47           | 224       | 239          | 263          | 399         | 489 | 332 |            |            |     |
| 103          | 228       | 240          | 308          | 406         | 504 |     |            |            |     |
| 124          | 235       | 242          | 319          | 467         | 505 |     |            |            |     |
| 126          | 236       | 257          | 329          | 469         | 550 |     |            |            |     |
| Biography as |           |              | 3-7          | 109         | 220 |     |            |            |     |
| 27           | 121       | 203          | 307          | 330         |     |     |            |            |     |
| Conservation | n Biology |              |              |             |     |     |            |            |     |
| 3            | 44        | 200          | 273          | 334         | 556 |     |            |            |     |
| 23           | 174       | 234          | 277          | 487         | 550 |     |            |            |     |
| Cytology     |           |              |              |             |     |     |            |            |     |
| 15           | 99        | 125          | 170          | 283         | 383 | 462 | 489        | 536        |     |
| 38           | 114       | 126          | 181          | 323         | 411 | 470 | 512        | 558        |     |
| 79           | 124       | 168          | 183          | 345         | 413 | 478 | 528        | 564        |     |
| Ecology      |           |              |              |             |     |     |            |            |     |
| 1            | 41        | 68           | 94           | 139         | 165 | 195 | 496        | 523        | 570 |
| 2            | 47        | 69           | 95           | 140         | 172 | 196 | 497        | 524        | 571 |
| 3            | 48        | 71           | 100          | 141         | 173 | 197 | 501        | 525        | 5.1 |
| 4            | 51        | 72           | 101          | 144         | 176 | 200 | 502        | 526        |     |
| 6            | 52        | 73           | 103          | 145         | 177 | 202 | 503        | 531        |     |
| 7            | 55        | 74           | 108          | 146         | 182 | 204 | 508        | 532        |     |
| 9            | 57        | 75           | 111          | 147         | 185 | 205 | 510        | 533        |     |
| 12           | 58        | 76           | 113          | 148         | 186 | 206 | 512        | 534        |     |
| 13           | 59        | 77           | 115          | 149         | 187 | 207 | 513        | 535        |     |
| 14           | 60        | 81           | 120          | 150         | 188 | 208 | 514        | 538        |     |
| 16           | 61        | 82           | 123          | 151         | 189 | 208 | 517        | 546        |     |
| 17           | 62        | 86           | 123          | 151         | 190 | 209 | 518        | 546<br>547 |     |
| 19           | 63        | 87           | 131          | 156         | 190 | 211 | 518        | 553        |     |
| 20           | 64        | 88           | 131          | 150         | 191 | 212 | 520        | 557        |     |
| 35           | 65        | 90           | 132          | 158         | 192 | 219 | 520<br>521 | 567        |     |
| 40           | 66        | 93           | 138          | 158         | 193 | 223 | 522        | 569        |     |
| Economic Bo  | otany     |              |              |             |     |     |            |            |     |
| 109          | 121       | 214          | 542          | 543         | 544 |     |            |            |     |
| Evolutionary |           | •            | - · <b>-</b> |             |     |     |            |            |     |
| 8            | 69        | 107          | 150          | 167         | 211 | 220 | 411        | 470        |     |
|              |           |              | 150          | 167         | 211 | 339 | 411        | 470        |     |
| 47           | 72        | 108          | 161          | 173         | 219 | 346 | 441        | 483        |     |
| 64           | 87        | 125          | 162          | 201         | 224 | 370 | 442        | 484        |     |
| 65           | 101       | 129          | 163          | 207         | 230 | 371 | 443        | 512        |     |
| 66           | 106       | 145          | 164          | 208         | 274 | 372 | 452        | 567        |     |
|              |           |              |              |             |     |     |            |            |     |

Appendix 1. Continued.

| Genetics            |           |            |            |            |            |            |            | <u> </u>   |            |
|---------------------|-----------|------------|------------|------------|------------|------------|------------|------------|------------|
| 8                   | 38        | 84         | 105        | 298        | 310        | 450        | 476        | 484        | 500        |
| 15                  | 39        | 104        | 108        | 299        | 343        | 452        | 483        | 486        |            |
| Herbaria<br>245     |           |            |            |            |            |            |            |            |            |
| Invertebrates       | 3         |            |            |            |            |            |            |            |            |
| 1                   | 47        | 129        | 150        | 194        | 274        | 315        | 396        | 466        | 547        |
| 2                   | 57        | 131        | 151        | 195        | 276        | 316        | 431        | 467        | 553        |
| <b>4</b><br>9       | 64<br>77  | 132<br>133 | 156<br>180 | 196<br>197 | 277<br>278 | 327<br>358 | 432<br>433 | 482<br>512 | 569<br>570 |
| 16                  | 81        | 138        | 186        | 206        | 282        | 372        | 434        | 517        | 370        |
| 17                  | 100       | 147        | 187        | 269        | 300        | 390        | 445        | 519        |            |
| 20                  | 116       | 148        | 188        | 271        | 303        | 391        | 455        | 538        |            |
| Mineral Nut         | rition    |            |            |            |            |            |            |            |            |
| 24                  | 76        | 258        | 359        | 393        | 417        | 531        |            |            |            |
| 63                  | 198       | 259        | 360        | 403        | 432        | 534        |            |            |            |
| 66                  | 226       | 312        | 361        | 406        | 525        | 568        |            |            |            |
| 69                  | 227       | 355        | 378        | 415        | 530        |            |            |            |            |
| Morphology          | c -       |            |            |            | 2.50       |            |            |            |            |
| 8                   | 85        | 115        | 167        | 264        | 350        | 424        | 448        |            |            |
| 22<br>29            | 92<br>106 | 117<br>134 | 199<br>206 | 272<br>324 | 384<br>414 | 425<br>426 | 451<br>506 |            |            |
| 79                  | 107       | 154        | 224        | 324        | 423        | 427        | 527        |            |            |
| Ornamental          |           |            |            |            |            |            |            |            |            |
| 54                  | 89        | 142        | 233        | 511        | 561        |            |            |            |            |
| 78                  | 109       | 210        | 330        | 560        | 562        |            |            |            |            |
| Pathology           |           |            |            |            |            |            |            |            |            |
| 325                 | 369       | 377        | 546        |            |            |            |            |            |            |
| Physiology          |           |            |            |            |            |            |            |            |            |
| 12                  | 65        | 119        | 192        | 257        | 325        | 348        | 395        | 457        | 534        |
| 24                  | 66        | 140        | 198        | 258        | 331        | 359        | 406        | 459        | 536        |
| 42                  | 69        | 141        | 229        | 261        | 332        | 360        | 416        | 471        | 537        |
| 43<br>56            | 70<br>97  | 144<br>169 | 230        | 263<br>268 | 333<br>339 | 374<br>378 | 417<br>446 | 473<br>490 | 559<br>565 |
| 56<br>61            | 101       | 175        | 231<br>233 | 268<br>269 | 339<br>340 | 378<br>379 | 446<br>448 | 490        | 568        |
| 62                  | 117       | 176        | 247        | 292        | 341        | 380        | 453        | 508        | 571        |
| 63                  | 118       | 179        | 256        | 308        | 342        | 383        | 456        | 509        |            |
| Phytosociolo        | gy        |            |            |            |            |            |            |            |            |
| 13                  | 60        | 94         | 189        | 218        | 297        | 418        | 513        |            |            |
| 14                  | 72        | 111        | 204        | 219        | 301        | 440        | 520        |            |            |
| 51                  | 74<br>82  | 120        | 207        | 220        | 344        | 458        | 522        |            |            |
| 54<br>55            | 82<br>87  | 123<br>172 | 208<br>209 | 221<br>225 | 354<br>387 | 468<br>471 | 523<br>524 |            |            |
| 58                  | 93        | 182        | 212        | 288        | 405        | 502        | 557        |            |            |
| Systematics         |           |            |            |            |            |            |            |            |            |
| 19                  | 48        | 92         | 160        | 178        | 237        | 270        | 345        | 465        | 528        |
| 22                  | 54        | 102        | 161        | 199        | 238        | 271        | 371        | 470        | 535        |
| 25                  | 56        | 105        | 162        | 200        | 239        | 272        | 402        | 471        | 549        |
| 38                  | 69        | 108        | 163        | 224        | 240        | 297        | 408        | 512        | 563        |
| 39<br>41            | 73<br>85  | 121<br>125 | 164<br>167 | 235<br>236 | 242<br>248 | 301<br>317 | 440<br>454 | 513<br>517 |            |
|                     |           | 143        | 107        | 230        | 440        | ۱۱ کی      | 7.74       | 311        |            |
|                     | re        |            |            |            |            |            |            |            |            |
| Tissue Cultur<br>53 | 110       | 233        | 313        | 349        | 541        |            |            |            |            |

APPENDIX 2. Bibliographic citations sorted by taxonomic categories.

| APPENDIX 2.           | Bibliogr    | aphic citati | ons sorted | by taxonor | nic categor | ies. |     |            |     |
|-----------------------|-------------|--------------|------------|------------|-------------|------|-----|------------|-----|
| Bromeliaceae          | <del></del> |              |            |            |             |      |     |            |     |
| 16                    | 78          | 91           | 175        | 202        | 299         | 332  | 365 | 437        | 511 |
| 37                    | 79          | 112          | 181        | 204        | 303         | 333  | 376 | 463        | 527 |
| 58                    | 80          | 139          | 194        | 220        | 316         | 339  | 378 | 469        | 528 |
| 59                    | 84          | 142          | 195        | 229        | 320         | 341  | 390 | 481        | 543 |
| 60                    | 85          | 143          | 196        | 231        | 327         | 352  | 391 | 494        |     |
| 69                    | 89          | 153          | 197        | 298        | 331         | 360  | 393 | 497        |     |
| Gesneriaceae          |             |              |            |            |             |      |     |            |     |
| 53                    | 199         | 340          | 350        | 476        |             |      |     |            |     |
| Lichens               |             |              |            |            |             |      |     |            |     |
| 19                    | 123         | 200          | 239        | 252        | 285         | 328  | 397 | 454        | 534 |
| 49                    | 130         | 205          | 240        | 253        | 301         | 337  | 400 | 460        | 537 |
| 50                    | 135         | 213          | 241        | 254        | 302         | 364  | 403 | 473        | 546 |
| 76                    | 137         | 235          | 242        | 265        | 305         | 373  | 405 | 475        | 548 |
| 82                    | 182         | 236          | 243        | 266        | 306         | 382  | 430 | 498        | 557 |
| 116                   | 184         | 237          | 249        | 267        | 309         | 384  | 438 | 516        |     |
| 122                   | 185         | 238          | 251        | 284        | 323         | 388  | 448 | 520        |     |
| Nonvascular           | -           |              | <b>.</b>   |            |             |      |     |            |     |
| 14                    | 82          | 173          | 218        | 296        | 366         | 404  | 436 | 491        | 532 |
| 35                    | 88          | 189          | 219        | 301        | 369         | 405  | 438 | 495        | 557 |
| 51                    | 113         | 190          | 220        | 311        | 375         | 407  | 441 | 496        | 563 |
| 55                    | 120         | 191          | 221        | 323        | 381         | 409  | 454 | 501        |     |
| 61                    | 122         | 192          | 222        | 324        | 385         | 415  | 460 | 522        |     |
| 62                    | 123         | 193          | 250        | 338        | 392         | 420  | 470 | 523        |     |
| 71<br>74              | 140<br>144  | 198          | 265        | 355        | 398         | 421  | 477 | 524<br>525 |     |
|                       | 144         | 205          | 266        | 364        | 401         | 435  | 480 | 525        |     |
| Orchidaceae<br>1      | 31          | 98           | 138        | 170        | 257         | 314  | 408 | 458        | 550 |
| 2                     | 32          | 100          | 145        | 171        | 258         | 317  | 411 | 462        | 551 |
| 3                     | 33          | 101          | 146        | 172        | 259         | 319  | 412 | 464        | 552 |
| 4                     | 34          | 102          | 147        | 174        | 260         | 325  | 413 | 465        | 554 |
| 5                     | 35          | 103          | 148        | 179        | 261         | 326  | 417 | 472        | 555 |
| 2<br>3<br>4<br>5<br>6 | 36          | 104          | 149        | 187        | 262         | 329  | 420 | 478        | 556 |
| 7                     | 38          | 105          | 150        | 188        | 263         | 330  | 421 | 479        | 558 |
| 8                     | 39          | 106          | 151        | 201        | 269         | 334  | 422 | 487        | 559 |
| 9                     | 41          | 107          | 152        | 203        | 270         | 335  | 423 | 488        | 560 |
| 10                    | 42          | 108          | 154        | 210        | 271         | 336  | 428 | 489        | 561 |
| 11                    | 43          | 109          | 155        | 211        | 273         | 343  | 431 | 492        | 562 |
| 12                    | 44          | 110          | 156        | 214        | 276         | 344  | 432 | 493        | 564 |
| 15                    | 45          | 113          | 157        | 215        | 278         | 347  | 433 | 499        | 565 |
| 17                    | 46          | 114          | 158        | 217        | 279         | 349  | 434 | 500        | 566 |
| 18                    | 48          | 115          | 159        | 225        | 280         | 353  | 439 | 504        | 567 |
| 20                    | 52          | 117          | 160        | 226        | 283         | 369  | 440 | 505        | 568 |
| 21                    | 54          | 118          | 161        | 228        | 290         | 370  | 442 | 507        | 569 |
| 22                    | 70          | 119          | 162        | 231        | 291         | 377  | 443 | 518        | 570 |
| 23                    | 73          | 121          | 163        | 232        | 292         | 379  | 444 | 519        | 571 |
| 25                    | 77          | 124          | 164        | 233        | 294         | 380  | 445 | 529        |     |
| 26                    | 81          | 125          | 165        | 234        | 295         | 383  | 446 | 536        |     |
| 27                    | 83          | 126          | 166        | 246        | 300         | 387  | 447 | 539        |     |
| 28                    | 90          | 127          | 167        | 247        | 304         | 394  | 449 | 541        |     |
| 29                    | 94          | 128          | 168        | 248        | 310         | 399  | 452 | 542        |     |
| 30                    | 97          | 131          | 169        | 256        | 313         | 402  | 455 | 549        |     |
| Piperaceae            |             |              |            |            |             |      |     |            |     |
| 450                   | 451         | 515          |            |            |             |      |     |            |     |
| Pteridophyta          |             |              |            |            |             |      |     |            |     |
| 47                    | 144         | 264          | 371        | 471        | 485         | 513  |     |            |     |
| 56                    | 183         | 272          | 396        | 483        | 486         | 538  |     |            |     |
| 99                    | 206         | 289          | 453        | 484        | 512         | 544  |     |            |     |

Appendix 2. Continued.

| Other Plant | Family |     |     |     |     | -   |     |     |
|-------------|--------|-----|-----|-----|-----|-----|-----|-----|
| 63          | 178    | 282 | 345 | 367 | 414 | 426 | 457 | 510 |
| 92          | 224    | 307 | 346 | 374 | 415 | 427 | 459 | 536 |
| 134         | 245    | 309 | 351 | 395 | 424 | 428 | 506 |     |
| 136         | 268    | 318 | 359 | 406 | 425 | 456 | 509 |     |

APPENDIX 3. Bibliographic citations sorted by location of study.

| Boreal       | ,         |            |            |            |            |            |            |            |   |
|--------------|-----------|------------|------------|------------|------------|------------|------------|------------|---|
| 241          |           |            |            |            |            |            |            |            |   |
| Florida      |           |            |            |            |            |            |            |            |   |
| 10           | 58        | 195        | 204        | 299        | 332        | 345        |            |            |   |
| 11           | 60        | 196        | 217        | 317        | 335        | 469        |            |            |   |
| 44           | 70        | 197        | 298        | 331        | 336        | 490        |            |            |   |
| General      |           |            |            |            |            |            |            |            |   |
|              | (5        | 120        | 1.61       | 211        | 283        | 225        | 407        | 165        | 510                                     |
| 3<br>8       | 65<br>66  | 129<br>130 | 161<br>162 | 211<br>222 | 283<br>285 | 335<br>336 | 407        | 465<br>472 | 519                                     |
| 15           | 68        | 130        | 163        | 224        | 286        | 343        | 411        | 472<br>474 | 534<br>536                              |
| 20           | 73        | 131        | 164        | 230        | 297        | 343<br>351 | 420        | 474        | 540                                     |
| 21           | 74        | 133<br>135 | 166        | 251        | 307        | 354        | 421        | 479        | 542                                     |
| 23           | 75        | 136        | 167        | 252        | 310        | 356        | 422        | 480        | 545                                     |
| 35           | 80        | 144        | 168        | 253        | 319        | 364        | 423        | 481        | 554                                     |
| 41           | 90        | 149        | 170        | 254        | 321        | 366        | 424        | 482        | 555                                     |
| 42           | 96        | 149<br>150 | 173        | 260        | 323        | 368        | 425        | 483        | 556                                     |
| 45           | 108       | 151        | 174        | 262        | 324        | 371        | 426        | 484        | 562                                     |
| 47           | 115       | 152        | 184        | 272        | 325        | 381        | 427        | 486        | 563                                     |
| 49           | 117       | 154        | 186        | 273        | 326        | 385        | 430        | 487        | 566                                     |
| 51           | 118       | 155        | 201        | 274        | 327        | 389        | 446        | 500        | • |
| 54           | 122       | 159        | 208        | 277        | 330        | 399        | 449        | 514        |   |
| 64           | 128       | 160        | 210        | 281        | 334        | 400        | 454        | 516        |   |
| Greenhouse a | and Labor | atorv      |            |            |            |            |            |            |   |
| 26           | 32        | 46         | 105        | 169        | 258        | 294        | 377        | 494        | 559                                     |
| 28           | 33        | 53         | 110        | 179        | 290        | 313        | 379        | 499        | 565                                     |
| 29           | 34        | 78         | 119        | 215        | 291        | 314        | 380        | 505        |   |
| 30           | 36        | 97         | 142        | 233        | 292        | 349        | 492        | 507        |   |
| 31           | 43        | 98         | 143        | 247        | 293        | 360        | 493        | 558        |   |
| Neotropical  |           |            |            |            |            |            |            |            |   |
| 1            | 63        | 95         | 138        | 187        | 227        | 270        | 332        | 367        | 416                                     |
| 2            | 67        | 100        | 139        | 188        | 229        | 271        | 333        | 370        | 417                                     |
| 4            | 69        | 101        | 145        | 192        | 231        | 275        | 339        | 374        | 418                                     |
| 5            | 71        | 102        | 146        | 193        | 232        | 276        | 340        | 376        | 428                                     |
| 5            | 72        | 103        | 147        | 194        | 234        | 278        | 341        | 378        | 429                                     |
| 7            | 73        | 104        | 148        | 198        | 235        | 282        | 342        | 386        | 431                                     |
| 9            | 77        | 106        | 152        | 199        | 236        | 288        | 347        | 387        | 432                                     |
| 16           | 79        | 107        | 153        | 200        | 237        | 295        | 348        | 390        | 433                                     |
| 17           | 80        | 109        | 155        | 202        | 239        | 300        | 350        | 391        | 434                                     |
| 18           | 84        | 111        | 156        | 203        | 242        | 303        | 352        | 393        | 437                                     |
| 24           | 85        | 112        | 157        | 204        | 244        | 311        | 354        | 394        | 439                                     |
| 25           | 86        | 114        | 158        | 207        | 245        | 312        | 356        | 395        | 442                                     |
| 37           | 87        | 120        | 172        | 209        | 250        | 315        | 357<br>358 | 402<br>407 | 443<br>444                              |
| 38           | 89        | 121        | 175        | 218        | 261<br>263 | 316<br>318 | 358<br>361 | 407        | 444<br>445                              |
| 40           | 91<br>92  | 124<br>125 | 178<br>180 | 219<br>220 | 263<br>264 | 318        | 362        | 410        | 443<br>447                              |
| 57<br>59     | 92<br>93  | 125        | 180        | 220        | 268        | 328        | 363        | 413        | 455                                     |
| 60           | 93<br>94  | 132        | 183        | 226        | 269        | 331        | 365        | 415        | 459                                     |
| 00           | 27        | 134        | 105        |            |            | 331        | 505        |            |   |

| A        | 2 | Con  | ٠. ـ. نـه |       |
|----------|---|------|-----------|-------|
| APPENDIX | 1 | ( On | mnı       | iea - |

| 462          | 471 | 501 | 512 | 523 | 529 | 543 | 553 | 569 |     |
|--------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 463          | 476 | 502 | 513 | 524 | 530 | 544 | 557 | 570 |     |
| 464          | 481 | 506 | 515 | 525 | 531 | 549 | 563 | 571 |     |
| 466          | 488 | 508 | 517 | 526 | 532 | 550 | 564 |     |     |
| 467          | 489 | 509 | 521 | 527 | 533 | 551 | 567 |     |     |
| 469          | 497 | 511 | 522 | 528 | 535 | 552 | 568 |     |     |
| Paleotropica | 1   |     |     |     |     |     |     |     |     |
| 2            | 55  | 171 | 214 | 240 | 284 | 346 | 392 | 452 | 504 |
| 12           | 81  | 176 | 221 | 248 | 287 | 353 | 396 | 456 | 512 |
| 13           | 99  | 177 | 223 | 250 | 289 | 356 | 402 | 457 | 538 |
| 14           | 109 | 183 | 225 | 256 | 301 | 357 | 407 | 458 | 539 |
| 22           | 113 | 189 | 228 | 257 | 304 | 368 | 414 | 461 | 540 |
| 38           | 127 | 193 | 235 | 259 | 307 | 369 | 440 | 468 | 541 |
| 39           | 134 | 200 | 236 | 279 | 308 | 372 | 441 | 474 | 547 |
| 48           | 165 | 206 | 237 | 280 | 328 | 375 | 450 | 501 | 560 |
| 52           | 168 | 212 | 239 | 281 | 344 | 383 | 451 | 503 | 561 |
| Temperate    |     |     |     |     |     |     |     |     |     |
| 2            | 76  | 137 | 205 | 266 | 332 | 397 | 435 | 477 | 546 |
| 19           | 82  | 140 | 213 | 267 | 337 | 398 | 436 | 485 | 548 |
| 44           | 88  | 141 | 227 | 296 | 355 | 401 | 438 | 491 |     |
| 50           | 116 | 182 | 238 | 302 | 359 | 403 | 448 | 495 |     |
| 56           | 122 | 185 | 241 | 305 | 373 | 404 | 460 | 496 |     |
| 61           | 123 | 190 | 243 | 306 | 382 | 405 | 468 | 498 |     |
| 62           | 130 | 191 | 249 | 309 | 384 | 406 | 470 | 520 |     |
| 67           | 136 | 204 | 265 | 331 | 388 | 409 | 473 | 537 |     |